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ABSTRACT

Comprehensive facility management databases designed by the Facility Management Institute of Ann Arbor (Michigan) have three major sections or "files": the space inventory file, the property control file, and the building and grounds file. The first two are alpha-numeric in design, while the third is essentially a graphic file. The space inventory file is far more extensive than most current inventories and provides detailed information ranging from room characteristics through information on the occupants and their use of the space. The property control file is essentially outside the purview of normal space management, since it deals only with property control. The building and grounds file has, as its most significant element, a computerized record of both maps and site plans as well as building plans. This computerized approach permits the actual design of renovations on the computer. The savings appear to justify the costs of the system by permitting: (1) more appropriate space assignments, (2) reduced space redundancy, (3) improved space forecasting, (4) identification of sloppy management practices, (5) better bidding on renovation projects, and (6) improved maintenance and custodial care controls. (MLF)

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SPACE MANAGEMENT:

PROMISING POTENTIALS THROUGH

A COMPREHENSIVE INFORMATION

DATA BASE

by

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All organizations exist in a state of change, i.e., they are constantly moving from some present set of conditions to some future set. Hence, the job of planning is to assess the present status, to set goals or objectives to describe the desired future condition, and to recommend the most appropriate way to get from "now" to "then".

The field of facilities is typical, for in this field we are always dealing with an existing set of facility conditions. When it is recognized that the term "facilities" includes several major categories (land, land improvements and developments, buildings and structures, rooms and spaces, workstations, and equipment), it should be evident that "analyzing existing conditions" is anything but a simple task. Nevertheless, it is a task which needs to be done.

In order to get from "now" to "then" in the area of facilities, there are only three techniques which can be employed. First, facility assets can be acquired. Examples are the purchase of land, the leasing of floor space in a building, the construction of a new building, the purchase of equipment, and the installation of additional workstations. Second, facility assets can be disposed of. The sale of land, the leasing (to others) of space, the demolition of buildings, and the surplussing of equipment are all typical. Third, and last, is the alteration of the existing facility situation through changes in use, changes in assignment or changes in the physical environment itself. Space management, as a function, must be concerned with all three of these change management techniques.

Typically, space management offices today have three basic functions: the inventorying of space, its assignment and/or re-assignment and, finally, its analysis. In terms of the inventory function, space management offices will typically have some general information on buildings and structures, basic information on the rooms and spaces included within buildings or structures, and limited information on workstations--often only the number which exist.

Space assignment and/or re-assignment as its name implies is simply concerned with who occupies an office or how a particular room is used. Re-assignment occurs as personnel change, organizations grow or reduce, and specific needs of any unit change in terms of the work they do and how they do it.

The analysis function implies measuring the inventory data against the actual operations of the organization. The purpose of such analytical efforts is to determine those facilities which may be either in short supply or in excess, as well as to determine the actual adequacy of space for any individual group within the organization. One output of the analysis process is utilization statistics (how much of our plant is in use how much of the time), and utilization figures are commonly used today -- the best known being "classroom utilization" and "laboratory utilization". Another typical analysis compares the facilities of one organization against those of another.

The Nature of the Problem

In the small organization, the goodness of an information data base is less significant because any competent space manager can personally "learn about" and come to "know" the facilities of his organization in detailed fashion. In larger organizations that is not the case, for there are few individuals in most major universities who have ever been inside all of the buildings, much less "know" in any detailed way their included rooms, spaces and workstations. Hence, it must be recognized that as organizations grow, there is, of necessity, an increasing reliance on the information data base. Thus whatever facts are included in the data base become the "real organization" for management purposes. In such situations, then, it becomes essential that the data base be as accurate and extensive as possible -- consistent of course with the ability of the organization to maintain it in reliable and up-to-date fashion.

While other administrative elements have been encouraged -- and funded -- to build appropriate data bases, the entire facility field, including space management, has been left behind. However, now that there is a real awakening to the fact that facilities are not just a cost, or an asset on a balance sheet, but constitute the physical environment "tools" of any organization, there is renewed interest in and emphasis on the development of appropriate information data bases for space management purposes.

What Is Typical Today

Many organizations today utilize the so-called "key plans" (small scale, one line floor plans) which purportedly show the room locations on a floor-by-floor basis for each building. Obviously, in a large organization such plans tend to get out-of-date and many organizations no longer attempt to update them more frequently than once each year. Clearly, this poses problems in many ways.

Computerized space inventories are in use in many organizations, but, typically, relatively few facts about each room are recorded. A very typical space inventory currently in use reports the following information:

1. Building number
2. Room number
3. Department or organization assigned to the room
4. Present use of the room
5. Whether or not the room is air conditioned
6. Square footage
7. Total capacity

The only workload information is what can be deduced from the "total capacity" figure. In classrooms or lecture halls, for example, capacity would equate with seats. In a laboratory, it would equate with work-stations, and in an office it would report the number of staff normally assigned to that office.

In addition to the above information most space management offices also maintain a file on general building information which includes such items as the age of the building, its basic construction, the presence of a standpipe system, and the type of roof -- all on a building-by-building basis.

What Is Needed?

If one is to build a better information data base, three major problems must be addressed. First rooms and buildings may change physically. After all, when the building was built initially, it had a variety of attributes, needs, and requirements which were programmed on a room-by-room basis. Over the years renovations have tended to change and extend the original systems and services into additional rooms and areas. Thus, there tend to be more 220V outlets in any building today than was the case when it was built and the same is true of other services and systems as well. Yet, none of this is available in any rational and easy to access form.

Second, even if a room has not changed, its use may have changed. In one institution, for example, certain small research laboratories were used as offices over a period of time; hence, not surprisingly, the "use" as reported on the inventory changed, too. Thus, from the space management standpoint, the small research laboratories had ceased to exist.

Third, the so-called use of the room may not communicate the kind of facilities which are actually needed. In one hospital, for example, renovation proposals were put forward by three different departments for laboratory facilities with different names to undertake different work. Since all three proposals were planned at the same time, it was discovered that the essential laboratory (in terms of its services, square footage and equipment) was for all practical purposes the same. Since all three were proposed for necessary, but occasional, use, it was possible to combine them into a single laboratory. Normally, though, three "redundant laboratories" with three different inventory "uses" would have been the result.

It should be clear, then, that if space management is to move ahead, it must have far better tools to work with than is presently the case. The answer would seem to be the "comprehensive" information data base.

The Comprehensive Information Data Base

The comprehensive information data bases that are currently being developed for facility management purposes consist of both alpha-numeric files and graphic files. The term "file" is used because each different subject constitutes a different "file" of information in the traditional sense of that phrase. While specifics may vary, the one designed by the Facility Management Institute for The World Bank, in Washingtor, D.C. is certainly state-of-the-art today. It consists of three major files of information.

File A -- Space Inventory Information. It is, perhaps, simplest to review this file in terms of its three sections.

The first section reports locater data:

1. Building Identifier
2. Room Number (all spaces -- even corridors and janitor's closets have a room number)

The second section reports information on the use and assignment of the space:

1. Organization to which assigned
2. Room use code
3. Name of occupant
4. Occupant's organization or department
5. Occupant's telephone number
6. Occupant's rank
7. Occupant's identification number (necessary to track equipment which is assigned in individuals, not to rooms)

The third grouping of information in File A reports physical facts or room attributes useful for space assignment, maintenance and custodial care. It includes such items as the following:

1. Room dimensions (from which the computer makes requested calculations)
2. Safety/security features
3. Availability of mechanical and electrical services
4. Lighting levels
5. Information on floor covering
6. The nature of the wall surface
7. The type of ceiling
8. Electrical fixture information
9. Window information
10. Window treatment information (drapes, venetian blinds, etc.)
11. Unusual facts

Thus, it should be clear that File A provides a powerful tool for space management purposes. Since all of the above information can be sorted and compared in a wide variety of formats, it provides an analysis opportunity which has never before existed.

File B -- Property Control. This file is not of particular interest to space management, but it provides the necessary statistics to track the four kinds of equipment which are typically inventoried by such operations, and in so doing provides the basic input for three of the programs of planned maintenance.

File C -- Buildings and Grounds File. This file is divided into two parts, the first of which is an alpha-numeric record and the second being a graphic file. The alpha-numeric record, File C-1, reports general building

information: date of construction, general building condition, general building use, building dimensions and size factors (number of stories), and description and condition statements on all major elements and systems, and, finally, ownership and leasing data.

File C-2 includes two broad categories of graphics: maps and site plans and building plans. In both cases, the concept of "layering" — basic to all computer graphics today -- permits the user to view only those items of information of concern to him. The ability, too, to move quickly from an overall view to a detailed close-up of a specific aspect is also a distinct advantage. Thus, it should be evident that computer graphics provide practical data management helps which normal, manual systems cannot.

The grounds file — site maps and site plans — is fairly straightforward and includes:

1. Land and its exact boundaries (the accuracy of the computer permits this)
2. Limitations on land usage (easements, right-of-ways, etc.)
3. Land improvements (sub-surface and overhead utilities, streets, sidewalks, area lighting, etc.)
4. Land developments (football fields, test tracks, air strips)
5. Location of all buildings and structures
6. Planting plans

The building plan file can best be described as "as-built-super-schematics" and are designed to be adequate not only for space analysis and assignment but for actual renovation planning as well. Thus, the renovation planning can be done directly on the computer using computer aided drafting (CAD) techniques. Bulletin changes can also be handled on the computer. Once the construction is completed, the renovation as planned (and as corrected through bulletin changes) can be input onto the computer so that the building plans are always up-to-date.

The actual level of detail provided can vary from organization to organization, but it can easily include such details as furniture arrangements and the specific location in each room of drains, utilities and safety and security equipment. Elevations and sections are typical, but the ability to create sections on a random basis depends on the specific nature of the computer system selected.

Some Concluding Comments

The fundamental question to be answered is the cost benefit issue: does such a comprehensive information data base result in real savings to the organization, for there is no doubt that substantial costs are involved in initiating the system and then in maintaining the data base. At this point, the answers seem to be quite positive:

1. More appropriate assignments can be initially made thus reducing the need for immediate alterations.

2. Space redundancy is reduced, i.e., renovating spaces for specific purposes when appropriate space is already present.
3. Space forecasting is improved because the "space base" is far more accurate.
4. Poor management practices — particularly in office assignments — can be much more easily pin-pointed. When it is recognized that offices constitute from 20% to 80% of the assignable space in most organizations, it should be evident that this could be a fruitful analysis for most organizations.
5. Because contractors typically include a 10%-15% "factor" in bidding renovation work because of the "unknowns" in existing structures, having accurate, available data has the effect of reducing these costs.
6. Improved controls in maintenance and custodial services become possible.